Characteristics of various green manure and catch crops in vegetable production in Finland

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EUVRIN meeting 9.-11.5.2017, Almeria

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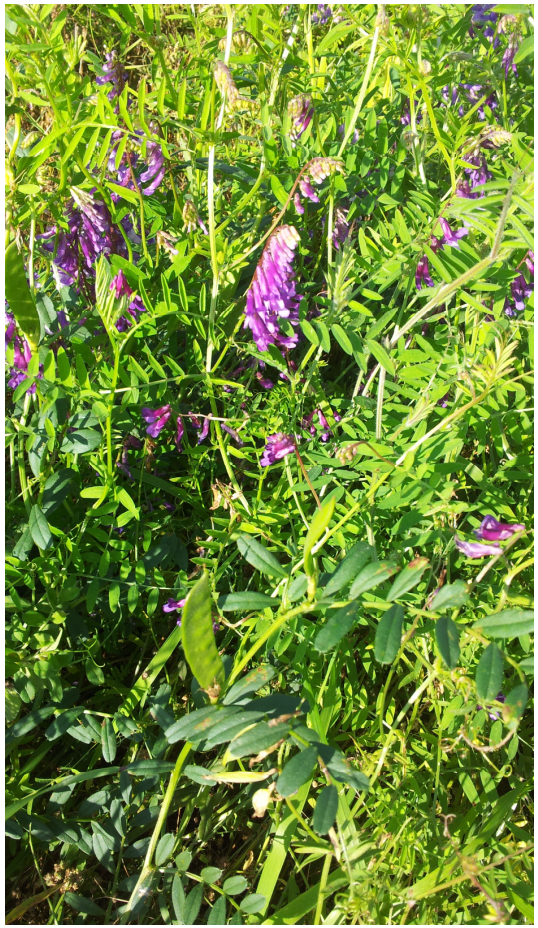
Green manuring



Green manuring is an important tool in organic vegetable production by

- fixing nitrogen
- recycling nutrients
- maintaining soil fertility

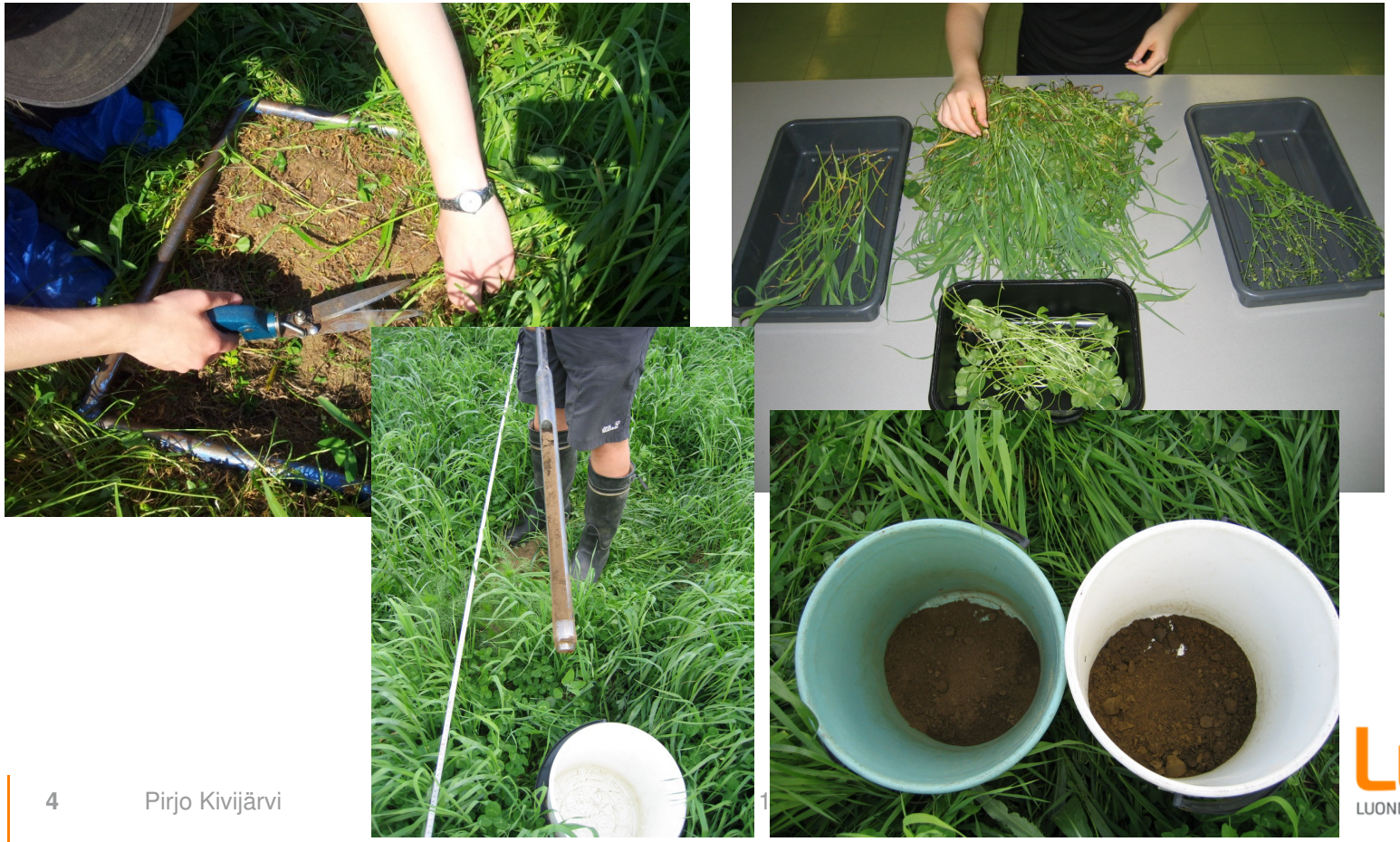
Catch crops

Catch crops are an important tool in organic vegetable production by

- preventing nutrient leaching
- reducing nutrient losses
- maintaining soil fertility

Objectives of our study

- To produce information of different green manure and catch crops used in rotation of organic vegetable farms, e.g. biomass production, dry matter content, nutrient content of different crops, nutrien content in the soil



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Dry matter content of different green manure crops

Crop growing stage	Dry matter %
Red clover (*Trifolium pratense*)	
blooming stage	16
in September	21
White clover (*Trifolium repens*)	
early summer	13
end of blooming	17
Timothy (*Phleum pratense*)	
in June	19-22
in the ear stage	23
end of blooming	28-29
White sweet clover (*Melilotus albus*)	
beginning of blooming	15
middle of blooming	23
Vetches (*Vicia*)	
beginning of blooming	20
pods (reproductive stage)	18-20
Pea (*Pisum sativum*)	
blooming stage	16-17
pods (reproductive stage)	21-22
Broad bean (Vicia faba)	
beginning of blooming	13
pods (reproductive stage)	17-18
White mustard (*Sinapis alba*)	
blooming stage	17-18
end of blooming	21
Tillage radish (*Raphanus sativus*)	7-8
Cereals	
early/green stage	20
in the ear stage	25

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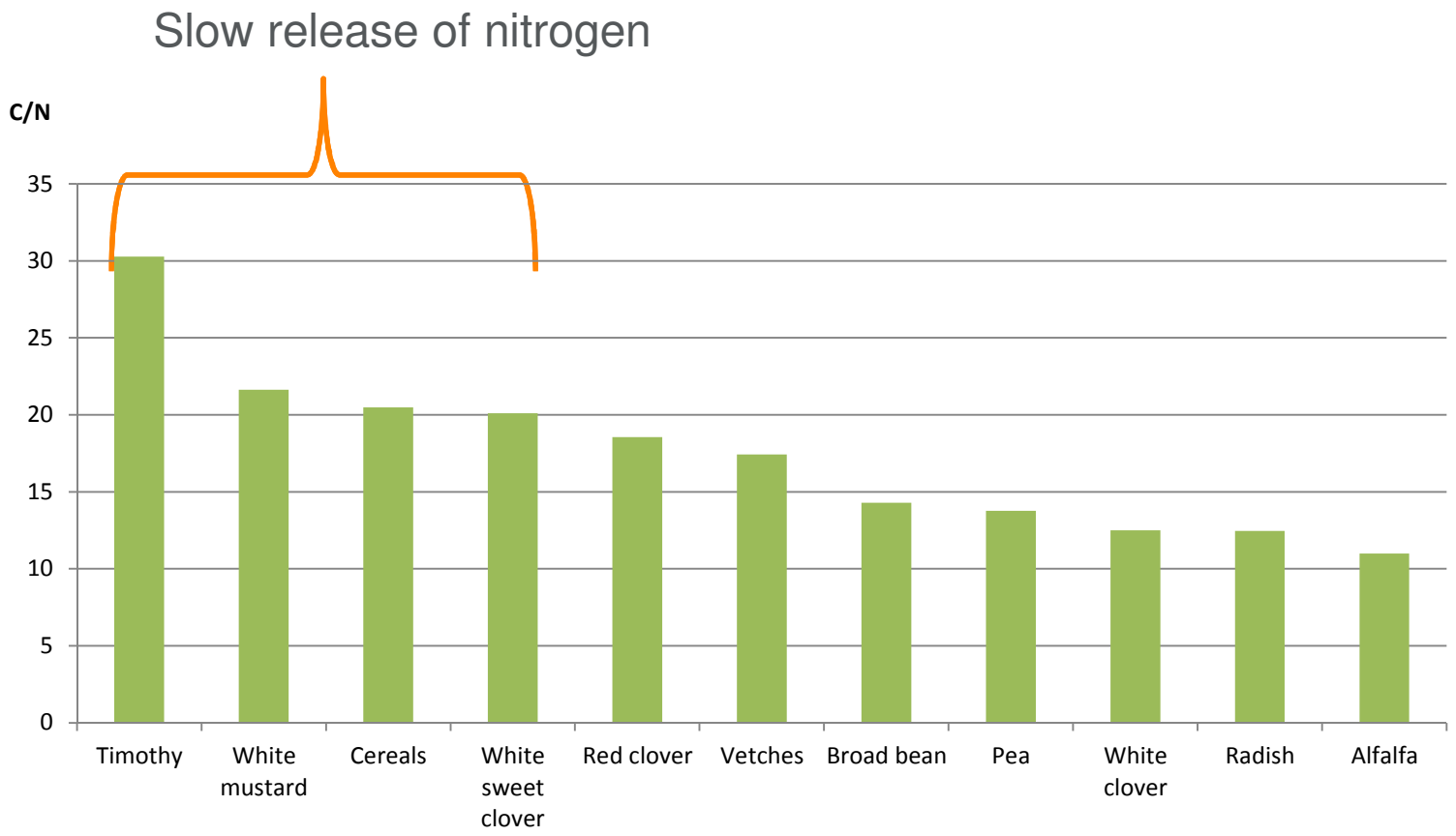
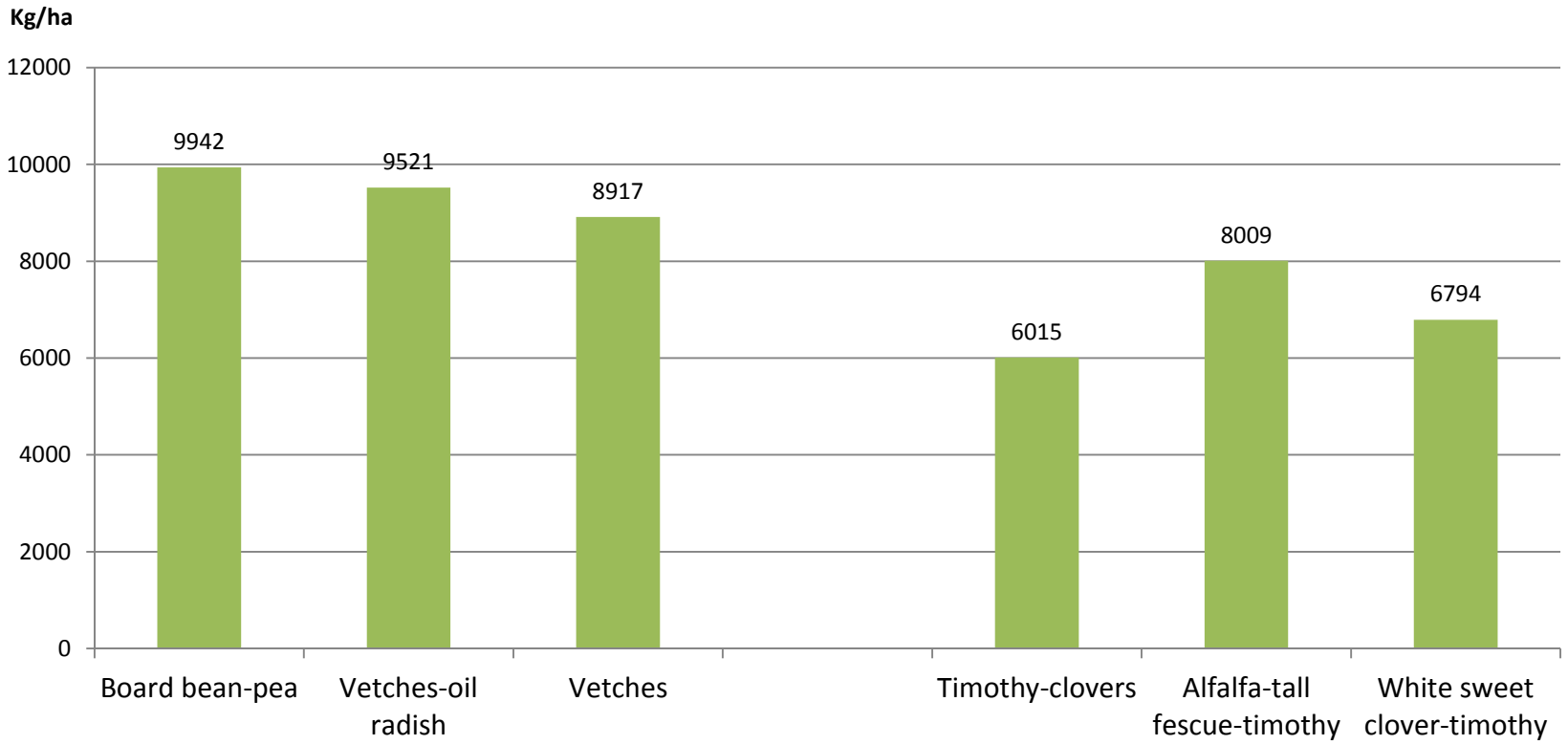
C/N-ratio of different crops



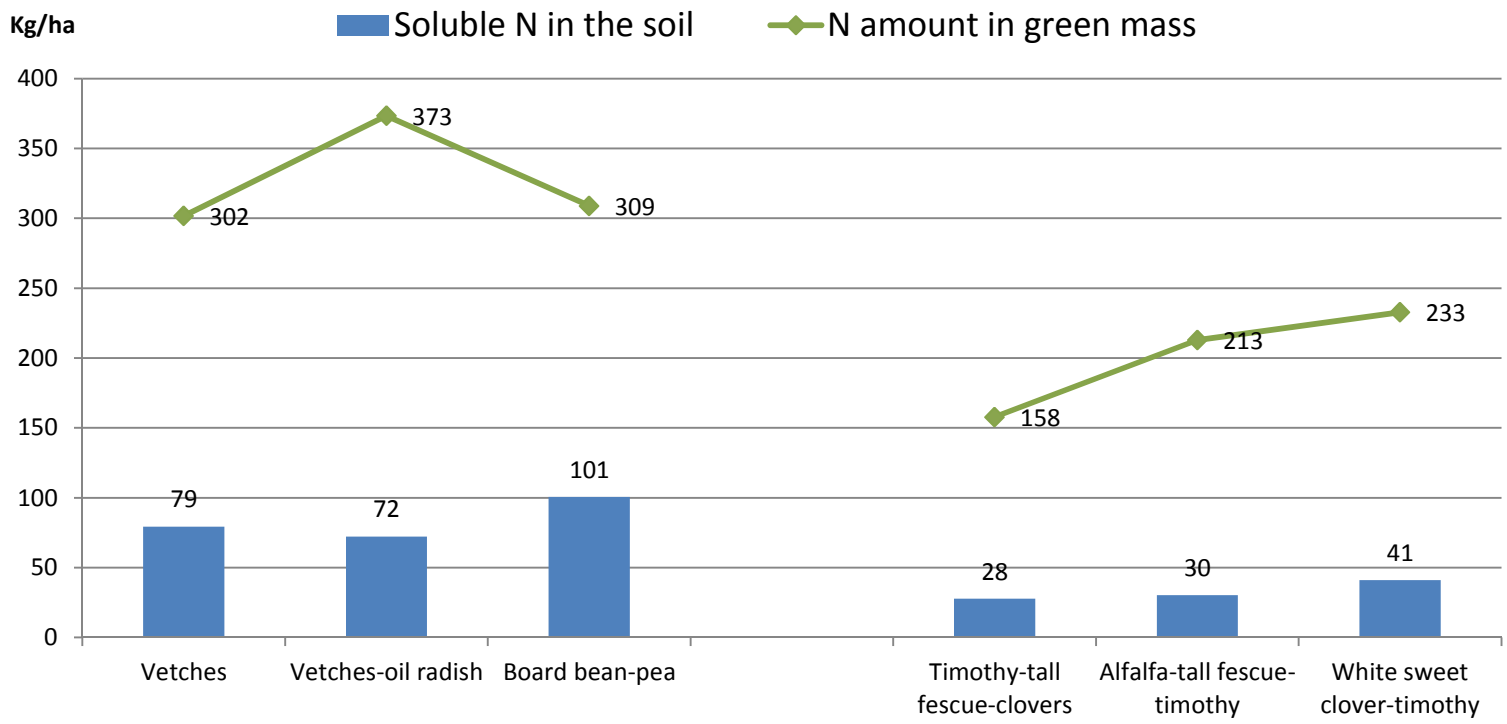
Nutrient content of different green manure and catch crops

	Nutrient content (% in dry matter) of different crops				
	N %	P %	K %	Ca %	S %
Red clover	2,3	0,2	2,0	1,4	0,1
White clover	3,3	0,3	3,5	1,4	0,2
Pea	3,0	0,3	2,2	1,3	0,1
Vetches	2,4	0,4	1,3	1,6	0,2
Alfalfa	3,7	0,4	2,9	1,8	0,2
White sweet clover	2,4	0,3	2,4	0,8	0,2
Board bean	2,9	0,4	2,3	0,9	0,1
Radish	3,0	0,5	5,6	1,8	0,6
White mustard	1,9	0,3	2,8	1,1	0,4
Timothy	1,5	0,3	2,4	0,3	0,1
Cereals	2,1	0,3	1,8	0,5	0,2

Examble – Dry matter production of annual and perennial green manure mixtures



Examble – N amount in green mass and soluble N in the soil in the beginning of November 2016



Green mass moved down and mixed into the soil 27.9.2016

Green mass moved down 27.9.2016

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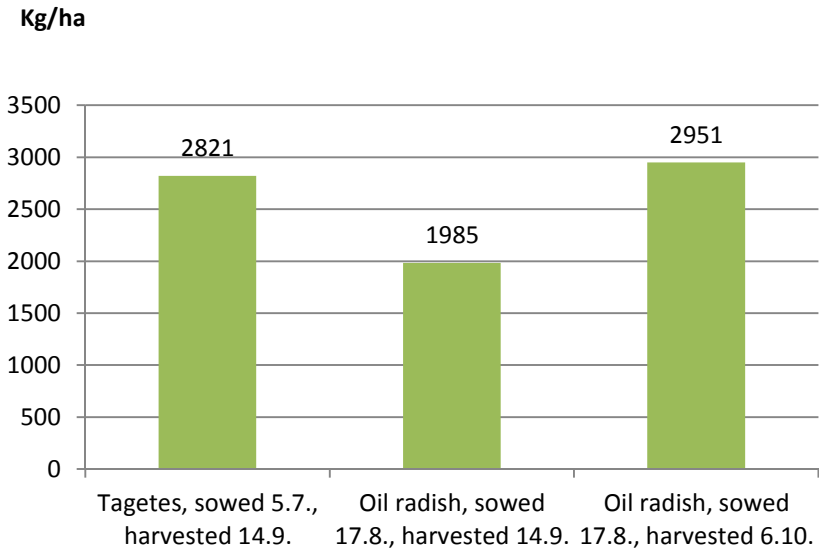
Catch crops

Dry matter production of different catch crops

- Tagetes after early cabbage
- Oil radish after Swedish turnip



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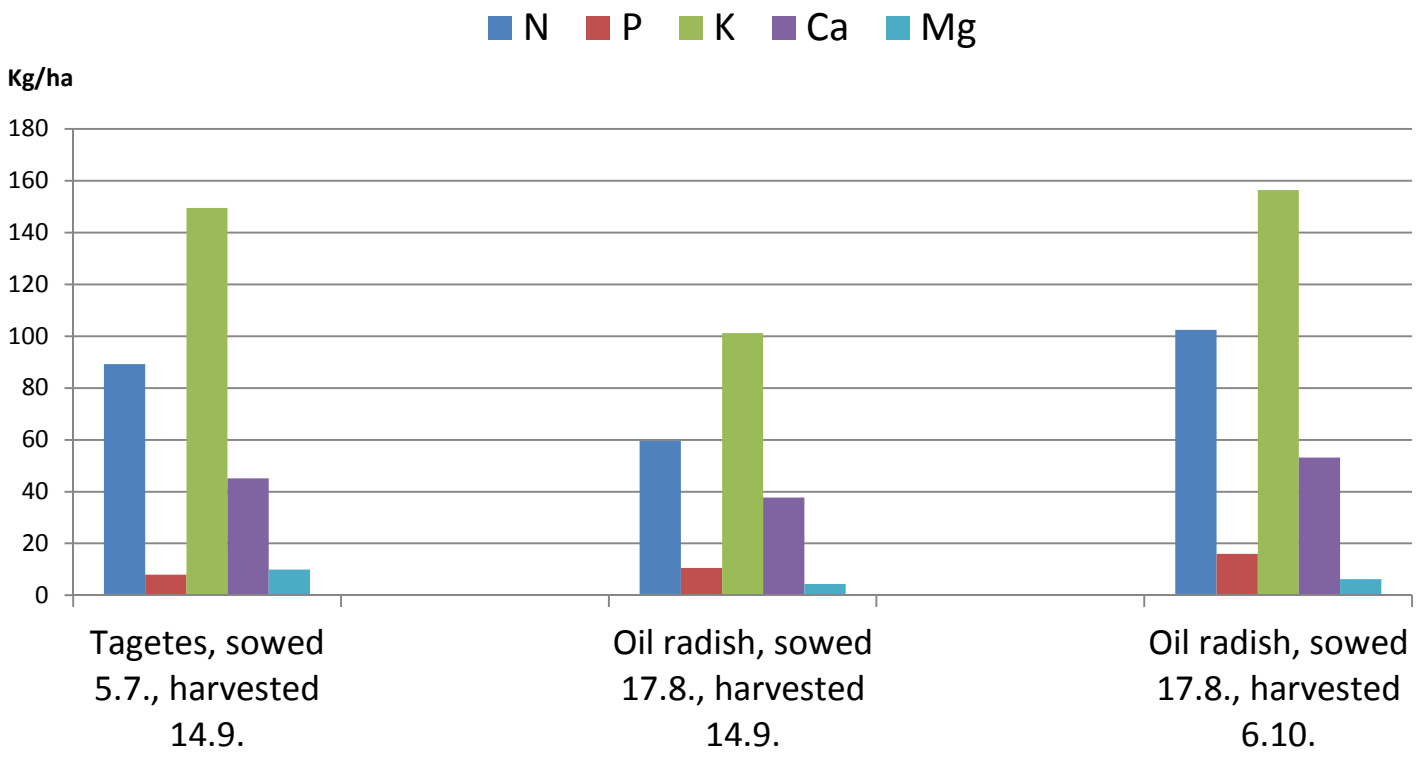
Catch crops

Nutrient uptake (kg/ha) of different catch crops in vegetable farm in 2016



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’Summa summarum’

The results help farmers to select green manure or catch crop for their vegetable crop rotation

We have also analysed the diseases of green manure crops and catch crops and their possible effects to following vegetable crop

Publication:

Characteristics of various catch crops in the organic vegetable production in northern climate conditions – results from an on-farm study:

http://www.helsinki.fi/ruralia/julkaisut/pdf/Reports165.pdf

Work with green manuring and catch crops will continue…